

CLAIMS

1. A high-frequency module for transmitting and receiving transmission-reception signals of communication systems of at least three kinds from an antenna, the signals to be inputted and outputted from particular input-output portions, respectively, the high-frequency module comprising:

an FET switch containing an antenna input-output portion to be connected to the antenna and at least three signal input-output portions whose (the connection of which) connection to the antenna input-output portion is switched in accordance with control signals to be inputted, the FET being constituted in such a way that the transmission signals of communication systems of three kinds are inputted from different signal input-output portions and that reception signals of at least two communication systems are outputted from the same signal input-output portion, and

a diplexer connected to the signal input-output portion, from which reception signals of at least two communication systems are outputted, of the FET switch and for separating the reception signals of two communication systems.

2. A high-frequency module as claimed in claim 1,

wherein the high-frequency module is a high-frequency module for transmitting and receiving transmission-reception signals of first, second, third, and fourth communication systems from an

antenna, and

wherein the FET switch contains first, second, third, and fourth signal input-output portions and is constituted in such a way that transmission signals of the first communication system and the second communication system are inputted to the first signal input-output portion, that transmission signals of the third communication system and the fourth communication system are inputted to the second signal input-output portion, that reception signals of the first communication system and the fourth communication system are outputted from the third signal input-output portion, and that reception signals of the second communication system and the third communication system are outputted from the fourth signal input-output portion.

3. A high-frequency module as claimed in claim 2, wherein a first diplexer connected to the third signal input-output portion and for separating a reception signal of the first communication system and a reception signal of the fourth communication system and a second diplexer connected to the fourth signal input-output portion and for separating a reception signal of the second communication system and a reception signal of the third communication system are contained.

4. A high-frequency module as claimed in claim 1,

wherein the high-frequency module is a high-frequency module for transmitting and receiving transmission-reception signals of

first, second, third, and fourth communication systems from an antenna, and

wherein the FET switch contains first, second, third, and fourth signal input-output portions and is constituted in such a way that a transmission signal of the first communication system and a reception signal of the second communication system are inputted to the first signal input-output portion, that transmission signals of the second communication system and the third communication system are inputted to the second signal input-output portion, that a reception signal of the third communication system is outputted from the third signal input-output portion, and that a reception signal of the first communication system and a transmission-reception signal of the fourth communication system are inputted to and outputted from the fourth signal input-output portion.

5. A high-frequency module as claimed in claim 4, wherein a first diplexer connected to the first signal input-output portion and for separating a transmission signal of the first communication system and a reception signal of the second communication system and a second diplexer connected to the fourth signal input-output portion and for separating a reception signal of the first communication system and a transmission-reception signal of the fourth communication system are contained.

6. A high-frequency module as claimed in claim 1,

wherein the high-frequency module is a high-frequency module for transmitting and receiving transmission-reception signals of first, second, and third communication systems from an antenna, and

wherein the FET switch contains first, second third, and fourth signal input-output portions and is constituted in such a way that a transmission signal of the first communication system is inputted to the first signal input-output portion, that transmission signals of the second communication system and the third communication system are inputted to the second signal input-output portion, that a reception signal of the third communication system is outputted from the third signal input-output portion, and that a reception signal of the first communication system and a reception signal of the second communication system are outputted from the fourth signal input-output portion.

7. A high-frequency module as claimed in claim 6, wherein a diplexer connected to the fourth signal input-output portion and for separating a reception signal of the first communication system and a reception signal of the second communication system.

8. A high-frequency module as claimed in any one of claims 1 to 7, wherein the FET switch is an FET switch using GaAs.

9. A high-frequency module as claimed in any one of claims 1 to 8,

wherein the high-frequency module contains a laminate having dielectric layers laminated therein, and

wherein each circuit element constituting the diplexer is made up of an electrode pattern formed on the surface of the dielectric layer.

10. A high-frequency module as claimed in claim 9, wherein, on the uppermost surface of the laminate, a plurality of lands for mounting an antenna input-output portion and each signal input-output portion of the FET switch are formed and a grounding electrode is formed substantially in the center where the plurality of lands are disposed.

11. A high-frequency module as claimed in claim 9 or 10, wherein, on the lowermost surface of the laminate, a plurality of electrodes for mounting the laminate on a mounting substrate is formed, and

wherein an electrode of the input-output portion for inputting a transmission signal and an electrode of the antenna input-output portion in the plurality of electrodes are formed along different sides of the laminate.